DOCUMENT RESUME

ED 247 716 EC 170 071

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TITLE LPAD Applications to Deaf Populations.
PUB DATE Jun 84
NOTE 20p.; Contained in: International Symposium on Cognition, Education, and Deafness (Washington, DC, June 5-8, 1984). Working Papers. Volumes I and II. David S. Martin, Ed.
PUB TYPE Speeches/Conference Papers (150) -- Viewpoints (120) -- Guides - Non-Classroom Use (055)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Cognitive Development; *Deafness; Elementary Secondary Education; *Student Evaluation; *Testing; Testing Problems; Test Use
IDENTIFIERS *Feuerstein (Reuben); *Learning Potential Assessment Device

ABSTRACT

The theory and purpose underlying R. Feuerstein's Learning Potential Assessment Device (LPAD) is reviewed, and implications for deaf education considered. It is argued that LPAD use will enhance: (1) assessment of deaf children from non-standard American backgrounds; (2) incorporation of assessment results into educational programming; and (3) the establishment of a growth potential, non-categorical approach to low-functioning children. However, it is also argued that the LPAD is difficult to administer due to communication requirements, assumes remediational programming currently beyond the vast majority of deaf educational programs, and fails to account for racial group differences found on standard psychometric measures. (Author/CL)

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ED247719

LPAD APPLICATIONS TO DEAF POPULATIONS

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Abstract

The theory and purpose underlying Feuerstein's Learning Potential Assessment Device (LPAD) is reviewed. It is argued that LPAD use will enhance: (a) assessment of deaf children from non-standard American backgrounds; (b) incorporation of assessment results into educational programming; and (c) the establishment of a growth potential, non-categorical approach to low-functioning children. However, it is also argued that the LPAD: (a) is difficult to administer due to communication requirements; (b) assumes remediational programming currently beyond the vast majority of deaf educational programs; and (c) fails to account for racial group differences found on standard psychometric measures.

EC170071

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Introduction

This paper has three goals: (1) to introduce concepts and theory underlying the LPAD; (2) briefly survey its purpose and appropriate uses; and (3) examine aspects of the LPAD critical for its application to deaf clients. With these goals in mind, it must be acknowledged at the outset that general theory and application of the LPAD must be given cursory review, in order to elaborate upon LPAD applications to deaf people. Therefore, the reader is provided a "quick sketch" of the LPAD and related theory. Other sources must be consulted for a more thorough knowledge of the LPAD.

Theories explaining group differences in IQ have generally adopted passive etiologies. In other words, group IQ differences are typically attributed to effects generally outside the school system. Successive explanations of group differences pushed the cause of the group IQ differences further back in time. For example, early childhood experiences were believed to cause minority group IQ lags. Birth risk factors, including maternal health during pregnancy and neonatal nutrition, were then cited as causes for lower performances among minorities. Finally, genetic causes were invoked to explain why Black and Hispanic children typically score one-half to one standard deviation lower than their White counterparts.

Each of these theories resulted in successively ineffective solutions. Head Start programs, initiated to close the preschool experience gap, have been of questionable effectiveness. Although worthy in other respects, social programs encouraging nutrition (e.g., "well baby clinics") have produced little noticeable change in group IQ differences; hereditary approaches offer no socially acceptable solutions to the problem; eugenics is politically unacceptable, and offers no immediate relief for the present IQ discrepancy between majority and minority groups.

This scenario renders the educator impotent to change group IQ differences. However, this impotence is self-serving in that repeated failures appear to support those educators who argue that the schools need not fear the responsibility for group IQ differences. Passive acceptance of the status quo is also encouraged by "child-centered" methods of instruction reincarnated from Rousseau's Emile. Montessori and Piagetian approaches advocate providing experience to the child, but at the child's own rate; active, demanding adult interventions interfere with the natural growth sequence.

The work of Feuerstein and colleagues stands in stark contrast to these approaches (Feuerstein, Miller, Hoffman, Rand, Mintzker, & Jensen, 1981; Feuerstein, Rand, & Hoffman, 1979; Feuerstein, Rand, Hoffman, & Miller, 1980; Feuerstein, Jensen, Hoffman, & Rand, Note 1). Feuerstein, et al. advocate active, immediate, penetration of the child's world, directly changing the child's cognitive structures via Mediated Learning Experience (MLE). Other factors (heredity, organicity, socio-economic status, emotional balance, cultural practices, and maturational levels) are relegated to secondary importance in the growth of intellect. These are distal variables; MLE is the proximal cause of adequate cognitive development (Feuerstein & Rand, 1974).

Theoretical Underpinnings of LPAD

The concept of MLE is central to the understanding and purpose of the LPAD. Feuerstein described MLE in the following manner:

> Mediated learning experience...is defined as the interactional processes between the developing human organism and an experienced, intentioned adult who, by interposing himself between the child and external sources of stimulation, "mediates" the world to the child by framing, selecting, focusing, and feeding back environmental experiences in such a way as to produce in him appropriate learning sets and habits. (Feuerstein, et al., 1979, 71)

This type of learning experience is contrasted with direct exposure, in which the child's development is modified through random or immediate environmental contact. Such unstructured contact is by definition less effective in imparting cognitive functions than MLE.

In this model, cognitive functions are learning habits or heuristics which the child employs when interacting with the world. Inadequate mental functioning is caused by one or more deficient functions. Deficient functions impair global mental functioning in varying degrees (depending upon the number, type, and severity of impaired functions).

Explanation of the cognitive map underlying Feuerstein's intellect model is beyond the scope of this paper. For the present, it is sufficient to point out that the map encompasses the following variables influencing mental acts (the singular units composing cognition, or thought):

1. the content universe of the act (how familiar the act is within a given culture);
2. the language or modality of the act (e.g., numerical, verbal, etc.);
3. the phase of cognitive functions required by the act (explained below);
4. cognitive operations required by the act (e.g., analogical thinking);
5. level of complexity (determined by the amount of information required by the act, and the novelty to the subject);
6. level of abstraction (the conceptual distance between the act and tangible, observable instances); and
7. level of efficiency (rapidity, precision, and ease of act performance--the "dependent" variable in the model).

The phases of cognitive functions are of central importance to the LPAD. The LPAD examiner uses the tools of dynamic assessment to examine the three phases of

mental acts: input, elaboration, and output. These phases may be likened to information-processing states. Input is the data-gathering stage; elaboration is the program or function performed with the data; and output is the end result, or product, of the act. Each of the stages is sequential (i.e., input precedes elaboration, which in turn precedes output). Therefore, deficient functions in any phase cause inefficient mental functioning (see Figure 1 for examples of deficient functions).

LPAD Purpose

The purpose of the LPAD is to identify deficient functions within each phase of the mental act. A variety of tools are employed, each representing an aspect of the independent variables found in the cognitive map (above).[1] Administration follows a test-teach-test paradigm. The examiner must mediate the subject's behavior to isolate at which phase, and under what conditions, deficiencies occur. The examiner provides the strategies necessary for successful solution of the task when the subject meets with difficulty (i.e., the examiner teaches the subject more efficient cognitive methods). The subject is again tested following instruction to determine the success of the attempted remediation. In this manner, the examiner identifies deficient functions, specifies under what conditions they occur, and predicts response to intervention.

In essence, the assessment process is MLE. The examiner mediates environmental stimuli (LPAD materials, or tools) for the subject by (a) establishing what is intended in the situation, (b) transcending the specific task (generalizing to varied settings and content), (c) assigning meaning to tasks, (d) providing a feeling of competence, and (e) regulating the subject's behavior. This intensive MLE serves to outline the strategy of further MLE directed towards remediating the

Figure 1.

COGNITIVE DEFICITS

INPUT	ELABORATION	OUTPUT
Blurred and sweeping perception.	Inadequate perception of existence and definition of problems	Egocentric communicational modalities
Unplanned, unsystematic impulsive exploration	Inability to select relevant vs. nonrelevant cues	Difficulties in projecting virtual relationships
Lack of receptive verbal tools	Lack of spontaneous comparative behavior	Blocking
Lack of or impaired spatial orientation	Narrowness of the mental field	Trial and error responses
Lack of or impaired temporal concepts	Episodic grasp of reality	Lack of verbal tools for communication
Lack of or impaired conservation of constancies	Lack of need for pursuing logical evidence	Lack of need for precision and accuracy
Lack of need for precision and accuracy	Lack of inferential hypothetical "iffy" thinking	Deficiencies in visual transport
Lack of capacity to consider 2 or more pieces of information	Lack of strategies for hypothesis testing	Impulsive acting out behavior
	Lack of or impaired planning behavior	Changes in motivation
	Nonelaboration of cognitive categories lacking verbal concepts	

Note- Adapted from Feuerstein et al., 1979.

specific, deficient cognitive functions. Instrumental Enrichment is the name given to the curriculum directed towards this cognitive restructuring (Feuerstein & Jensen, 1980; Feuerstein, et al., 1980; Feuerstein, et al., Note 1).

Because of its test-teach-test, MLE-approach to assessment, LPAD administration necessarily varies from one child to the next. It is the examiner's responsibility to see that LPAD tools are presented to the subject in a manner that eliminates misunderstanding, insuring that the functions identified as deficient are not merely measurement error. In a sense, the examiner assumes the role of a laboratory scientist. Discoveries are verified by repetition; findings dictate new directions, obviating the need for other paths of analysis.

Consequently, LPAD administration is never the same for any two children; time, style of presentation, and the choice of subtests are determined by the child's needs. Standardization is irrelevant. The only valid frame of reference for the LPAD is the individual being tested. No comparison to others (e.g., "average," "borderline," etc.) is sought or implied. The examiner is simply attempting to isolate causes of inefficient behaviors, and the conditions controlling their efficiency.

The analogy to laboratory science applies to the target population of the LPAD as well. A scientist never undertakes research without a question in mind; so, too, the LPAD examiner does not assess an individual without reason. Typically, the targets of LPAD have bee low-functioning (mentally retarded) adolescents. However, LPAD is indicated whenever discrepancies occur between function and IQ (e.g., learning disabilities, aphasia, etc.).

Differences between LPAD and psychometric tests are numerous, worthy of more discussion than may be provided here. A summary of some major differences may be found in Figure 2. Perusal of this summary suggests differences between LPAD and

Figure 2.

LPAD vs. PSYCHOMETRIC TESTING

LPAD Features	Psychometric Features
Theory	
Dynamic intelligence model	Static intelligence model
Needs intrinsic to child	Needs extrinsic to child
Diagnosis of problem	Classification of problem
Examiner/Subject Interaction	
Penetration of instructions	Emission of instructions
Teacher role	Observer role
Success oriented	Failure (ceiling) oriented
Feedback provided	Feedback forbidden
Time unspecified	Time regulated
Targets	
Processess (molecular)	Product (molar)
Present/future learning	Past learning
Applications	
Prescription	Placement
Cognitive change	Functional acceptance

psychometric testing are as great as differences existing between projective techniques and psychometric models. Furthermore, differences appear at all levels of assessment (theory, client interaction, assessment targets, and applications).

Two major features of LPAD require emphasis. First, LPAD assumes a dynamic model of cognitive functioning. It is assumed that through MLE (usually provided through Instrumental Enrichment), low-functioning people can improve their cognitive efficiency. The second is a logical corollary to the first; the responsibility for low-functioning is not with the retarded performer; it is with the educator. Because LPAD assumes cognitive functioning is teachable, impaired intellectual performance is legitimately placed within the domain of educational remediation. Likewise, the examiner "owns" the responsibility to find what engenders task success during the assessment. Repeated task failure is not the subject's fault, as the examiner has the responsibility to induce subject success during the assessment.

Not surprisingly, these major differences in assessment procedures, goals, and tools require extensive training which is not found within traditional assessment programs. At the present time, training is provided by those from the Feuerstein group at the Hebrew University in Israel, or by one of Feuerstein's colleagues (Mogens Reimer-Jensen) at Yale University. Those wanting to use the LPAD to assess children should receive training from one of these sources; two one-week workshops are considered the minimal level necessary to begin practice with LPAD techniques.

Applications to Deaf Populations

Little is known about LPAD applications to deaf subjects. Most LPAD research to date has focused upon mentally retarded adolescents in Israel. Therefore, much

of what follows is conjecture, based upon the author's clinical experience with the LPAD at the California School for the Deaf, Fremont, and available literature.

LPAD Strengths

Adolescents from nonstandard American cultural backgrounds form an ideal target population for LPAD. This point does not mean ethnic minority members born in the United States; rather, those born and raised in other (particularly non-Western) countries and cultures. The reasons for preferring the LPAD over traditional psychometric methods for this population are straightforward. First, the assumption that (U.S.) norms accurately represent the population from which the subject is drawn is probably violated. Second, standardized test results are meaningless for educational planning. Do low scores represent organic deficits, or lack of experience with materials? Third, the examiner is defeated by a dilemma. If materials are given following prescribed procedures, results are uninterpretable (second point above). However, if the examiner attempts to alter the administration of standardized instruments (e.g., "testing the limits" procedures), assumptions central to the test (constant administration) are violated. Finally, examiners wishing to avoid either horn of this testing dilemma are cast adrift into the "Sea of Clinical Judgment" when communicating their results to others. "It seemed.." "The examiner suspected..." and other qualifiers abound in these reports; those attempting to create educational programs from assessment results flounder without support, eschewing the psychological summary in favor of haphazard, in vivo methods.

Feuerstein's cognitive model provides a figurative map for exploring these individuals' uncharted cognitive territory. Techniques based upon replication, manipulation of independent variables, and attention to cognitive efficiency allow the examiner to isolate deficient functions. Experiential deficits may be separated from cognitive deficits by manipulating task structure and content. Results

assume order and precision, replacing the murky depths of opinion with the firm footing of empirical inquiry.

Two case histories illustrate this point. Two deaf Indochinese refugees, both young men, were referred for assessment. Both had been raised in (separate) rural areas of Indochina; neither attended school (the society was non-literate), nor did they communicate with others in the village by means other than gestures, according to information provided by relatives. Previous psychometric assessment results placed both cases in the Mentally Deficient range on non-verbal performance tests. School authorities desired an estimate of intellectual potential and suggestions for educational programming, since the young men had been enrolled in deaf education classes since their recent arrival in the United States.

Because of the unusual backgrounds presented by these individuals, and the informal impressions of educational staff members that the young men demonstrated intelligent behavior, LPAD assessment was conducted to determine current potential and performance levels. Although a comparative score was never generated (LPAD does not produce norm-referenced scoring), the examiner was able to specify severe deficits in verbal tools (e.g., neither person spontaneously classified objects) which are prerequisite to rudimentary academic instruction. More importantly, the examiner was able to draw upon learning increments within the assessment period as a benchmark for estimating how these deficient functions would respond to remediation attempts. This activity led to different placements for each of the young men (one was placed in a vocational rehabilitation setting, while the other was placed in a deaf education program). These outcomes could not have been anticipated by the results of psychometric assessment.

LPAD techniques also appear to be valuable for assessing multihandicapped deaf students. This application is particularly true when they exhibit an apparent discrepancy between IQ and observable functioning. A case history provides an

example. A deaf male adolescent (15 years old) had scored consistently in the 40-50 IQ range since four years of age, yet was working on multi-digit multiplication when he was referred for assessment. LPAD testing identified some extremely deficient input functions, which the student spontaneously controlled for numerical material. Although this knowledge has produced no sudden, miraculous "cure" for depressed functioning in non-math areas, teachers' long standing suspicions of the student's IQ score were replaced with concrete educational objectives oriented towards controlling input functions.

This result points out a second argument in favor of LPAD use with deaf subjects--results are immediately applicable to the educational setting. Although psychometric testing may allow the clinician to prescribe modifications in academic programs, such outcomes are more accidental than intentional. LPAD results identify more than deficient structures. They also specify the conditions which were successful in modifying that person's cognitive efficiency. Because the examiner has provided an MLE experience, suggestions for class and curricular activities rest upon a demonstrated success (e.g., "_____ worked for me").

Finally, the report produced from LPAD assessment is non-categorical, and growth-oriented. Rather than classifying a student as Borderline, Learning-Disabled, etc., results are descriptive of that particular student. Any clinician will acknowledge that special education labels subsume extremely heterogeneous populations. Assigning children to categories may be a need of the educational system, but it rarely helps the teacher or student to understand why the problem exists, or what to do about it. LPAD results describe functional deficiencies, while holding the door open to remedial (rather than alternative) programming.

LPAD Difficulties

Educators and psychologists can no longer afford the rosy scenarios offered by approaches "in vogue." LPAD is no exception. There are some serious limita-

tions regarding LPAD use with deaf populations which deserve attention if this analysis is to be accurate and honest.

Communication poses serious challenges to examiners utilizing LPAD tools. One of the key features of LPAD administration is penetrating the molar, surface level in order to access inner (molecular) structures. Typically, this is done by questioning the subject (e.g., "Why did you pick that answer?", "How did you get that answer?", "What makes this answer wrong?"). In cases where comprehension of question forms is not in the subject's repertoire, such questioning is frequently difficult. Admittedly, this difficulty is the examiner's problem (it is certainly not the fault of the child or the test materials). However, deaf multihandicapped adolescents or refugees pose unique problems for LPAD administration, as they often use their cognitive talents to imitate rather than understand, thus clouding the reliability of assessment results. This behavioral pattern is undoubtedly a sign of successful adaptation to their environment, yet it places severe constraints upon the examiner's ability to obtain subjective information (e.g., why the subject chose a particular item). Communication difficulties are compounded for those examiners who have marginal signing skills.

While LPAD assessment results appear readily applicable to remedial programming, interventions based upon Feuerstein's philosophies are beyond the scope of most deaf education programs. Currently, relatively few deaf education teachers are trained in Instrumental Enrichment (the curriculum developed to modify cognitive deficits). Even those who are (there a a number now including some at the California School for the Deaf, Maryland School for the Deaf, Model Secondary School for the Deaf at Gallaudet College) have not yet been trained to interface LPAD results with classroom activities. Ideally, this state of affairs will change for the better; however, given budget restrictions, increasing class sizes,

and cutbacks in support staff (limited psychologist time with students), it is unlikely that immediate large-scale changes will occur. The psychologist initiating LPAD techniques may well face a situation where reports are appreciated by an audience of one (while waiting for the rest of the system to catch up). It should also be added that even though the face validity of LPAD findings seems high, no predictive validity studies have been reported using deaf subjects.

Finally, there are some theoretical problems with LPAD and its underlying assumptions. In California, LPAD has been "marketed" as non-biased assessment. The implicit assumption is that current psychometric tests are biased with respect to ethnic/racial minorities. This assumption implies either of two closely related themes. The first contends that group IQ differences found on psychometric instruments are proof of the instruments' bias: remove the biased items and approaches, and all groups will be equal. The second holds that the groups may in fact differ with regard to overall cognitive efficiency, but this difference is the result of MLE deprivation. Minority cultures, so the logic goes, fail to mediate their children's learning experience because they feel they have nothing to offer in comparison to the dominant majority culture.

Both of these arguments are refuted by empirical investigations. Research demonstrating the integrity of common psychometric tests within and between racial, ethnic, and socio-economic status groups argues strongly against the biased content theory (Hale, 1983; Jensen, 1980; Jensen & Reynolds, 1982). The evidence disproving the MLE deprivation hypothesis is apparent to any deaf educator; i.e., deaf children exhibit typical intellectual development in spite of incredible linguistic and cultural deprivation (Vernon, 1967; 1968). MLE cannot account for this state of affairs without contortions, which would somehow suggest that deaf children experience adult mediation or interactive exchanges more frequently than hearing minority counterparts. Furthermore, such contortions would

also have to account for identical deaf and hearing factor structures on performance IQ tests, and hearing-deaf mean IQ differences being smaller than White-Black mean IQ differences (Braden, in press). In other words, theory modifications would have to account for the qualitative similarity of intellectual performance in all groups, and at the same time explain why deaf children do better than black children in spite of greater linguistic and cultural deprivation.

One could deny the problem by acknowledging only the individual's needs. Feuerstein would probably dismiss the issue of group IQ differences as irrelevant; what is important is this particular low-functioning performer and the reasons for his deficient functioning. When one is unconcerned with either demographics or theoretical issues, this solution is valid. Educational administrators and those desiring validation of MLE concepts in a "natural experiment condition" (i.e., what happens when children are deprived of linguistic and cultural interaction) will remain unsatisfied. LPAD cannot solve the problem of certain racial/ethnic over-representations in EMR classes. The subject-centered focus is blind to problems created by systems; LPAD recognizes only the intrinsic needs of the subject, not their relative proportions in bureaucratic categories. Problems posed by the relative success of deaf children in contrast to other groups should spark considerable debate regarding what constitutes MLE. It will be interesting to see if the definition resolving this challenge to MLE theory will be robust and empirical, or yet another "thinly disguised tautology for the mental functions that IQ tests are designed to measure" (Gordon & Rudert, 1979, 180).

Conclusion

The model and techniques offered by Feuerstein in the LPAD are promising. This comprehensive approach to assessment is a radical departure from psychometric techniques, yet it is well within sound scientific practices. It promises to be a

fruitful alternative to psychometric tests when the client is notably distant from normative populations, and/or exhibits significant discrepancy between IQ and specific functional areas. LPAD assessment of globally low-functioning deaf students has not been advocated (although Feuerstein, et al., would undoubtedly take a dim view of this stance) because current deaf education resources are incapable of legitimate remediation attempts.

The face validity of assessment results is high. Findings appear uniquely suited to tailoring educational programs to individual students. However, validity studies utilizing deaf subjects are lacking, suggesting caution before accepting LPAD utility claims. The communication demanded by the LPAD poses serious challenges for examiners testing deaf subjects. Finally, those seeking a panacea for majority/minority group differences will be disappointed in LPAD. The relatively unimpaired functioning which is typical of deaf children poses unique problems for MLE explanations of group differences and for theories proposing MLE as the proximal cause of adequate cognitive functioning.

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2. Feuerstein, R., Haywood, C., Rand, Y., & Hoffman, M. Examiner manuals for the Learning Potential Assessment Device. Book in preparation, 1982.

Footnotes

[1] The reader is referred to the extensive descriptions of LPAD tools in Feuerstein, et al., (1979), and Feuerstein, et al., (Note 2). A brief demonstration is planned for the Symposium presentation.

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Working Paper presented

at the

International Symposium

on

Cognition, Education, and Deafness

Gallaudet College, Washington, DC, June 5-8, 1984